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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,715	01/28/2002	Amit Singhal	02-02	7912

7590

07/02/2003

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EXAMINER

NGUYEN, CAM N

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/058,715

Applicant(s)
Singhal et al.

Examiner
Cam Nguyen

Art Unit
1754



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jan 28, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

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DETAILED ACTION

Claim Objections

1. Claims 1 & 15 are objected to because of the following informalities:

- A. In claim 1, line 5, “ ; ” should be deleted.
- B. In claim 15, line 2, a period “ . ” before “such as” should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112 (Second Paragraph)

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15 & 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Regarding claim 15, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

B. Claim 16 recites the limitation "the inert gas" in line 1. There is insufficient antecedent basis for this limitation in the claim.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamawaki et al., "hereinafter Yamawaki", (US Pat. 6,475,673 B1) taken together with Marsh et al., "hereinafter Marsh", (US Pat. 4,649,037).

Yamawaki discloses a process of producing a lithium titanate, comprising presintering a mixture of titanium dioxide and at least one lithium compound selected from the group consisting of lithium carbonate, lithium hydroxide, lithium nitrate, and lithium oxide for a duration of 30 minutes to 4 hours at a temperature of at least 600°C and less than 800°C to yield at least one of the composition comprising TiO_2 and Li_2TiO_3 and a composition comprising TiO_2 , LiTiO_3 and $\text{Li}_4\text{Ti}_5\text{O}_{12}$, and separately sintering the composition at a temperature of from 800°C to 950°C (col. 9, claim 1).

Regarding claim 1, the difference between Yamawaki and the claimed process, is that Yamawaki does not disclose dissolving the lithium containing salt in a liquid solution (or organic solvent).

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However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have utilized a known organic solvent as taught by Marsh in the process of Yamawaki in order to obtain metal oxide particles having the particles sizes that applicants desired because Marsh teaches such organic solvent is suitable for making metal oxides including a mixture of lithium and titanium oxide (or lithium titanate applicants claiming) (see Marsh at col. 3, ln 61-col. 6, ln 65 & col. 21, claim 10).

Regarding claim 2, the claimed lithium salts are met by the teaching of the reference (see Yamawaki at col. 9, claim 1).

Regarding claims 3 & 4, the claims are met by the teaching of the reference since Marsh teaches the organic solvent having a boiling point of less than about 130°C., with a boiling point of less than about 100°C is preferred (see Marsh at col. 4, ln 13-22). Note that the disclosed boiling point falls within the claimed boiling point.

Regarding claim 5, the claimed average primary particle size and average secondary (or aggregate) particle size are met by the teaching of the reference (see Marsh at col. 6, ln 44-65).

Regarding claims 6 & 7, Yamawaki does not disclose that “the heating step comprises refluxing”. However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have conducted the heating step by refluxing since refluxing provides for a homogeneous mixture and/or a well mixed of the metal solution.

Regarding claims 8 & 9, it appears that the claimed process conditions (pressure) and separation methods such as filtration, evaporation, and centrifuging are conventional. It would

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have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have done the same since the claimed process conditions and the separation methods have long been used in the metal oxide production methods.

Regarding claims 10-13, the claimed heat treating temperatures and duration time are met by the teaching of the reference since the disclosed heat treating temperatures and duration time fall within the claimed ranges (see Yamawaki at col. 9, claim 1).

Regarding claim 14, the claim is met by the reference because Yamawaki teaches conducting the presintering process in the presence of oxygen (see Yamawaki at col. 6, ln 8-12).

Claim Rejections - 35 USC § 102(e)/103

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 17 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamawaki et al., "hereinafter Yamawaki", (US Pat. 6,475,673 B1).

Yamawaki discloses lithium titanate having a formula $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (see col. 2, ln 22). The lithium titanate having an average particle size in the range of 0.1 to 15 μm , preferably in the range of 0.3 to 10 μm , and is more preferably in the range of 0.5 to 5 μm (see col. 4, ln 14-21). Note that, a particle size of 0.1 to 15 μm is equivalent to 100-5000 nm, which provides for nanostructured particles $\text{Li}_4\text{Ti}_5\text{O}_{12}$.

Yamawaki teaches the claimed nanostructured particles $\text{Li}_4\text{Ti}_5\text{O}_{12}$, thus anticipates the claim.

Recitation of product-by-process in the claim is noted. While the product of the reference is not made by the same process, the product made is the same the product being claimed. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even the prior art

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product was made by a different process.” See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 102(e)

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

9. Claims 18 & 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamawaki et al., “hereinafter Yamawaki”, (US Pat. 6,475,673 B1).

Yamawaki discloses lithium titanate with a spinel crystal structure presented by a formula $\text{Li}_4\text{Ti}_5\text{O}_{12}$ or a mixed crystal structure of $\text{Li}_4\text{Ti}_5\text{O}_{12}$, Li_2TiO_3 , and TiO_2 (see col. 2, ln 22). The lithium titanate having an average particle size in the range of 0.1 to 15 μm , preferably in the range of 0.3 to 10 μm , and is more preferably in the range of 0.5 to 5 μm (see col. 4, ln 14-21). Note that, a particle size of 0.1 to 15 μm is equivalent to 100-5000 nm, which provides for nanostructured particles $\text{Li}_4\text{Ti}_5\text{O}_{12}$.

The claimed particles size range is met by the teaching of the reference since it falls within the disclosed particle size range (see Yamawaki at col. 4, ln 14-21).

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With respect to the claimed “average particle diameter of being less than about 300 nm” in claim 18, it is inherent that the particle diameter of the particles disclosed by the reference are the same since the product is the same.

Citations

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Michot et al. (US Pat. 6,365,301 B1), Readey et al. (US Pat. 4,026,811), Kida et al. (US Pat. 6,436,577 B1), Yamasaki et al. (US Pat. 6,379,843 B1), Riley (US Pat. 4,567,031), Yun et al. (US Pat. 6,319,421 B1), & Hedouin et al. (US Pat. 6,294,011 B1) are cited for related art.

Conclusion

11. Claims 1-19 are pending. Claims 1-19 are rejected. No claims are allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Cam Nguyen, whose telephone number is (703) 305-3923. The examiner can normally be reached on M-F from 8:30 am. to 6:00 pm, with alternative Monday off.

The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 (before finals) and (703) 872-9311 (after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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Cam Nguyen

Nguyen/cnn *CAN*

Patent Examiner

June 27, 2003

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